Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 74 of the	)	MM Docket No. 93-24
Commission's Rules With Regard	)	
to the Instructional Television	)	
Fixed Service	)	

COMMENTS

HARDIN AND ASSOCIATES, INC.

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Hardin and Associates, Inc. ("Hardin") hereby responds to the Commission's solicitation of comments on the ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING, MM Docket 93-24 ("FNPRM"). Hardin is a Professional Engineering firm which has extensive experience in MMDS and ITFS and represents numerous clients as engineering counsel before the Commission.

1. The Filing Window System. Hardin supports the desire of the Commission to speed the processing of ITFS applications. If the window system as employed in LPTV will accomplish that goal, Hardin supports such a change. However, as expressed in the FNPRM, there always exists the possibility of abuse of such a system.

The arguments forwarded in the FNPRM that ITFS applicants which will not lease their excess time will not be significantly affected by the change are correct in the long term. However, in the short term, these, as well as other legitimate applicants, could be put at a disadvantage. In many cases, preparation of a complete ITFS application takes much more than the sixty (60) day period of notification of the opening of the first window would allow. As such, many applicants may not be able to apply in the first window and would, assuming application which would be mutually exclusive were filed in the first window, the applicant which missed the first window would effectively be barred for ever filing.

Given that the present freeze on the filing of new ITFS applications has been in place for over nineteen (19) months and coupled with the tremendous rise of interest in wireless cable including use of ITFS channels, it is reasonable to assume that numerous applications will be filed in the first window. It is also reasonable to assume that, if spectrum speculators do exist, that they will expend significant resources to prepare as many applications as possible for filing in the first window. Resources that may not be as available to smaller ITFS applicants.

Given the foregoing, **Hardin recommends that, should the commission adopt the window filing system, the first window should be announced 150 to 180 days prior to the opening of that window**. While there may be some applicants who will still not be able to prepare their applications in time, this delay will allow a much larger percentage to participate.

2. Receive Site Letters. Hardin has experienced several situations in which competing applications have claimed receive sites which have later been found not to have agreed to be receive sites. As such, **Hardin recommends that a letter of intended use from an official of each receive site be required for the inclusion of the receive site**.

3. Expedited Consideration of Applications. **Hardin is in agreement with the WCA that adoption of this proposal will accelerate the development of wireless cable systems.** However, for this proposal to work, the Commission must strictly enforce the requirements of equipment ordering and station construction. Any extension requests and reconsideration of dismissal petitions must be dealt with quickly. As such, **Hardin recommends adoption of expedited processing as outlined in Paragraph 19 of the FNPRM with the additional requirements as follows:**

a. **All requests for extension of time to construct and any other motions be acted upon with thirty (30) days of receipt by the commission.**
b. **In no case should more than one three (3) month extension of time to construct be granted.**
c. **Should the station not be constructed, the applicant should be barred from submitting a new application for any ITFS channels within fifty (50) miles of the licensed transmit location for two (2) years from the date of dismissal or forfeiture.**
d. **A request for expedited processing should have no bearing in determination of in a mutually exclusive situation.**

Hardin does not see the need for a requirement for the applicant to control a certain number of channels in the market to receive expedited processing.

4. Area of Operation. **Hardin recommends that the area of operation of an ITFS station be defined in the same manner as an MMDS Protected Service Area.** This would allow for consistency in the rules and, given the significant leasing of excess time, is practical as well.

5. Offset Operation. **Hardin strongly opposes to use of 28 dB as the Desired-to-Undesired (D/U) signal ratio when offset operation is proposed.**

The discussions and proposed implementations of offset operation have varied significantly and have, generally, not been based on applicable research. Presently, ITFS and MMDS transmitters are required to maintain the visual and aural carriers within 1,000 Hz of their respective assigned frequencies. The original, and presently only substantive and reliable, research done in the area of offset operation and its effect on viewability was done by RCA Laboratories in the late 1950's. In that research, it was found that, with an offset of a integer multiple of 10,010 Hz, the effect of an interfering cochannel carrier on picture viewability was lessened. In fact, a number of 28 dB was forwarded and the accepted standard. However, that number was based on the broadcast industry Carey curves which are a statistical prediction tool which allow for interference to occur some defined percentage of the time. As such, **with a 28 dB D/U ratio, interference will occur some percentage of the time.** In addition, the research further found that, with the carrier frequencies held exactly on their assigned frequencies, if the offset was varied further than +/– 10 Hz, the allowable reduction in D/U ratio was significantly lessened. As such, **for effective offset operation, not only does the offset need to be 10,010 Hz, but also the carriers of each of stations in question will need to be held within +/– 5 Hz, thereby allowing the total variance to be held to +/– 10 Hz.**

Given the foregoing, offset operation as presently proposed does not allow a lowering of the D/U ratio. However, if an offset of an integer multiple of 10,010 Hz and a precision frequency control of the visual and aural carriers of +/– 5 Hz is employed, some reduction in the D/U ratio is possible.

Some less rigorous research has been performed in several wireless systems employing such precision frequency control and precise offset ("PFC-PO"). The general consensus of the participants has been that a reduction of the D/U ratio to approximately 35 dB appears to possible for long term stability.

Given the foregoing, **Hardin proposes that, for an application to reduce the cochannel D/U ratio to 35 dB, the applicant must propose Precision Frequency Control (+/- 5 Hz) and Precise Offset (+/- 10,010 or integer multiple of same).** In addition, the applicant proposing offset should be required to pay all reasonable costs associated with the implementation of PFC-PO in the other station's operation, including any necessary filings with the Commission.

The use of forced offset operation should only be allowed once the Protected Service Area ("PSA") has been expanded. Presently, the vast percentage of wireless cable operations serve and count on serving customers outside the present PSA. If forced offset operation were allowed without an expansion of the PSA, these presently operating or proposed stations could be significantly damaged, in an economic sense.

6. Receive sites at distances of greater than 35 miles. Generally, the agruments forwarded in the FNPRM are both reasonable and technically sound. However, there are methods which can be employed which would allow a receive site at a distance of more than 35 miles from the transmit site received an acceptable signal. As such, **Hardin recommends that, should such a receive site be proposed, the applicant should be required to also include an engineering analysis demonstrating that the site will receive an signal of acceptable quality. Also, the distance receive site should be constructed within 12 months of the grant of the application including such a site.** If the applicant or licensee meets these requirements, these sites should be afforded interference protection.

7. Major Modifications. **Hardin recommends that the rules concerning major modifications be conformed to the MMDS rules, i.e Sections 21.40, 21.41 and 21.42 of the Rules.** These rules are in place and well understood and such conformance would ease the engineering analyses included in applications.

8. Interference Studies. The commission is correct in its statement that terrain blockage may not necessarily completely block the interfering signal. The Longley-Rice model proposed in the FNPRM is a more exact and critical projection of signal level due to terrain obstruction. **As such, Hardin supports the requirement of inclusion of terrain path profiles and inclusion of Longley-Rice predicted additional path losses in the analysis of ITFS receive sites.** However, in the case of a PSA analysis, the inclusion of terrain path profiles or Longley-Rice based analysis is overly burdensome.

The Longley-Rice model is a point-to-point analysis tool. If the Commission requires its use in the analysis of PSAs, the Commission must also provide an definition of the location and number of points to be analyzed in the PSA including a methodology for both omni-directional and various directional transmit antennae. The Commission must also define which PSAs, as a function of distance, must be analyzed. The Commission must then be prepared for the number of pages and exhibits in applications to increase geometrically. In short, the time and cost to prepare applications and the time to process applications will all increase dramatically.

As an option, Hardin proposes that the Commission allow applicants to continue to use terrain blockage as a basis for a claim of non-interference in the case of a PSA. However, the Commission should allow the other station to submit an analysis based on terrain plots and Longley-Rice analyses to counter the claim. This allows expeditious application preparation and processing which still protecting the small number of cases where interference may occur.

The Commission should also formally recognize that a properly prepared Radio Shadow Map depicts the same terrain blockage information that is depicted in multiple terrain path profiles. Each is based on exactly the same information and it is much easier to glean the information from the Radio Shadow Map.

Respectfully submitted,

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